University of the Philippines Manila
COLLEGE OF NURSING

DISASTER RISK REDUCTION

Erickson R. Bernardo, MAN, RN
Assistant Professor

erbernardo@up.edu.ph

BTS'
"Dynamite"

has **114 beats** per minute, the
right tempo for Hands-Only CPR.

NATION OF LIFESAVERS
American Heart Association®

Bruno Mars'
"Grenade"

has **110 beats** per minute, the
right tempo for Hands-Only CPR.

NATION OF LIFESAVERS
American Heart Association®

ENHYPEN's
"Bite Me"

has **114 beats** per minute, the
right tempo for Hands-Only CPR.

NATION OF LIFESAVERS
American Heart Association®

Olivia Rodrigo's
"Traitor"

has **101 beats** per minute, the
right tempo for Hands-Only CPR.

NATION OF LIFESAVERS
American Heart Association®

WICKED's
**"Dancing
Through Life"**

has **117 beats** per minute, the
right tempo for Hands-Only CPR.

NATION OF LIFESAVERS
American Heart Association®

Miley Cyrus's
"Flowers"

has **118 beats** per minute,
the right tempo for
Hands-Only CPR.

NATION OF LIFESAVERS
American Heart Association®

Sabrina Carpenter's
"Please Please Please"

has **107 beats** per minute, the
right tempo for Hands-Only CPR.

NATION OF LIFESAVERS
American Heart Association®

LEARNING OUTCOMES

At the end of this session:

1. Describe essential nursing interventions related to disaster prevention and mitigation

2. Describe essential nursing interventions related to disaster preparedness

3. Familiarize with the different disaster preparedness phase

PHASES OF DISASTER

PHASES OF DISASTER

DISASTER PREVENTION AND MITIGATION

DISASTER PREVENTION, MITIGATION AND PREPAREDNESS

- In whole, disaster prevention, mitigation, and preparedness focus on **capacity building and pre- impact/incident activities**, with the **goal** of preparing to manage the crisis.

DISASTER PREVENTION

DISASTER PREVENTION – "outright avoidance of adverse impacts of hazards and related disasters. It expresses the intention to **completely avoid potential adverse impacts** through advance actions such as construction of dams or embankments to eliminate flood risks, land use regulations deterring human settlement in high-risk zones, and seismic engineering designs that ensure the survival and function of critical buildings in case of earthquakes." (RA 10121)

DISASTER MITIGATION

DISASTER MITIGATION – "the **lessening or limitation of the adverse impacts of hazards and related disasters**. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness". (RA 10121)

DISASTER PREVENTION AND MITIGATION

In the context of health and nursing, prevention and mitigation efforts in general focus on **identifying risks**, **reducing vulnerabilities and exposure**, and **enhancing capacities** of communities (WHO & ICN, 2009).

1. Early Warning Systems (EWS)
2. Immunization
3. Nutrition and Food Security
4. Water, Sanitation and Hygiene (WASH)
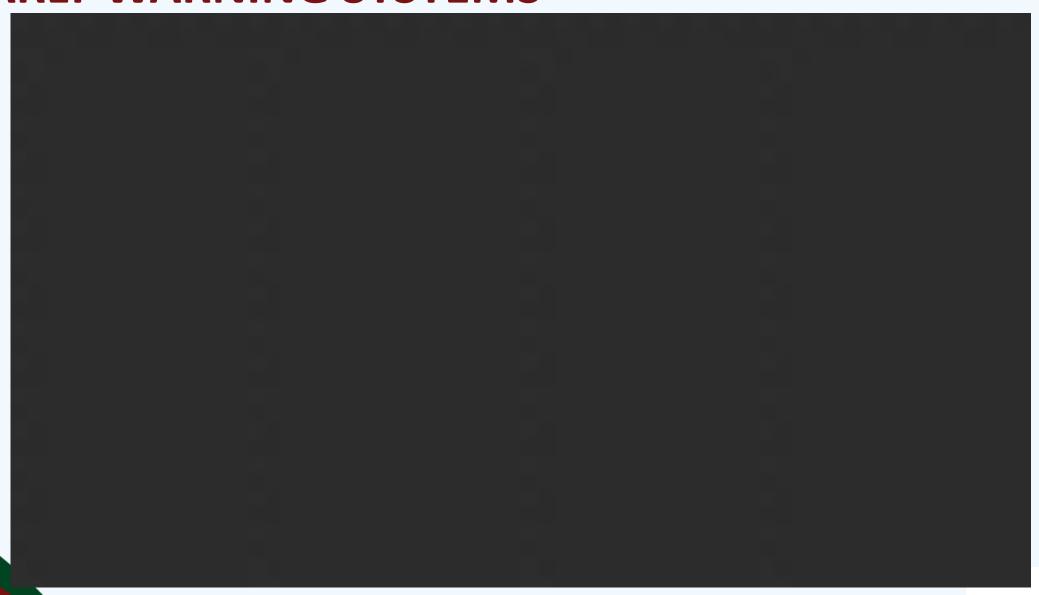5. Control and Surveillance of Endemic Diseases

The nurse should provide attention to these five areas or aspects to ensure individuals, families, population groups, and communities have **improved health and nutritional status** (Bonito & Minami, 2017) and can **cope with disasters and emergencies**.

EARLY WARNING SYSTEMS

EARLY WARNING SYSTEM - is a tool consisting of communication equipment and systems that empowers individuals and communities to prepare, respond and protect themselves, their properties and their environments appropriately and timely during a disaster (CCS, MaCEC & SAC Northern Quezon, 2011).

Collaboration and participation of all actors from the barangay to national levels in developing and implementing EWS is critical – from identification of hazards to community response (CCS, MaCEC & SAC Northern Quezon, 2011). The nurse in the community, hospital, workplace or any other setting should be familiar with the early warning system so as to **help people prepare, respond, and protect themselves** when disasters or emergencies occur.
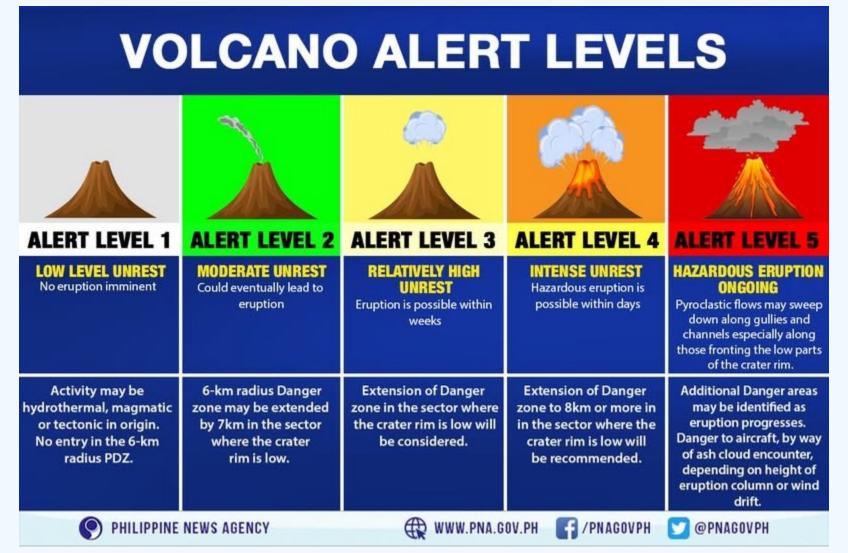
EARLY WARNING SYSTEMS [Click here to watch the video](#)

EARLY WARNING SYSTEMS

- **Early Warnings For ALL (EW4ALL) | UNDRR - https://www.youtube.com/watch?v=a8it-ZgS6Ew**
- **Project NOAH's Early Warning System - https://www.youtube.com/watch?v=9Mj--fUtDO8**
- **Disaster preparedness mechanisms: how do early warning systems work in the Philippines? - https://www.youtube.com/watch?v=G_xV5-p-KQI**
- **Early Warning Systems Save Lives in Disaster-prone Communities - https://www.youtube.com/watch?v=Cb8-18F14Hk**

The **Rainfall Warning System (RWS)** is designed to alert concerned communities and emergency managers about heavy rainfall events that would cause flooding.

There are two types of warnings issued under the RWS, the Thunderstorm Warning System (TSTM-WS) for short duration rainfall and the Heavy Rainfall Warning System (HR-WS) for long duration rainfall.

THUNDERSTORM WARNING SYSTEM (TSTM-WS)

WARNING LEVEL

Information

WHAT IT MEANS
Small chance of thunderstorm development

HOW TO STAY UPDATED

Watch

WHAT IT MEANS
Thunderstorm is likely to form within the next 12 hours.

HOW TO STAY UPDATED

Warning

WHAT IT MEANS
Thunderstorm is threatening a specific area within the next 2 hours. Updates will be issued as necessary.

HOW TO STAY UPDATED

IMPACTS
· Flash floods
· Possible power interruption
· Traffic congestion in urban areas due to flooding
· Lightning strikes

HEAVY RAINFALL WARNING SYSTEM (HR-WS)

· For rainfall events of **long duration** and **widespread rain**
· Covers a larger area
· Usually caused by tropical cyclones, monsoons, etc.

WARNING LEVEL

ADVISORY

COMMUNITY AWARENESS
Flooding is possible.

HOW TO STAY UPDATED

IMPACTS
· Flooding in low-lying areas especially along river channels

WHAT TO DO
· Listen to the radio or watch the news for the latest updates.
· Monitor the water levels in rivers and low-lying areas.

ALERT

COMMUNITY PREPAREDNESS
Flooding is alarming.

HOW TO STAY UPDATED

IMPACTS
· Flooding in other areas
· Possible landslides

WHAT TO DO
· Get ready for evacuation with your emergency kit.

EMERGENCY

COMMUNITY RESPONSE
Serious flooding is damaging.

HOW TO STAY UPDATED

IMPACTS
· Widespread flooding
· More roads are not passable
· Higher chance of landslides

WHAT TO DO
· Evacuate to higher ground and away from landslide prone areas.

https://www.pagasa.dost.gov.ph/themes/hiraia//assets/images/publications/Rainfall-Warning-A4-11.7x8.3-Back.jpg

IMMUNIZATION

Child and adult immunizations are part of public health measures to **reduce morbidity and mortality from vaccine-preventable diseases** such as measles, mumps, chickenpox, polio, hepatitis, influenza, and pneumonia, among many others. Herd immunity, also known as population or community immunity, is the **indirect protection from infectious disease** that occurs when a population is immune through vaccination or previous infection (WHO, 2020).

When immunization rates are low (i.e. ratio of people vaccinated vs. total target population to be vaccinated is low), a disease outbreak can occur which can escalate into an epidemic if not mitigated. Therefore, the nurse must **ensure that the target population are immunized** according to the recommended age, dose, and schedule, and that a large portion of the community is vaccinated (i.e. high immunization rate or coverage) **to develop and maintain herd immunity**.

NUTRITION AND FOOD SECURITY

People's survival is dependent on sustained access to food and maintenance of adequate nutrition (Powers & Daily, 2010). **In disasters and emergencies, food supply is often interrupted**. Food aid programs are usually short-term and target specific population groups, and may be inadequately distributed due to challenging circumstances (e.g. damaged or destroyed food stores or deliveries, stolen, sold or diverted) (ibid). Food shortage and severe nutritional deficiencies can occur particularly in vulnerable populations such as infants, children, breastfeeding mothers, and elderly (Veneema, 2019). Poor nutritional status also increases the susceptibility of individuals to various illnesses, whether in regular times or during disasters.

Hence, **ensuring continuous availability and access** of the people to sufficient, safe, and nutritious food should be one of the critical priorities of the nurse, in partnership with the different stakeholders and sectors such as agriculture and social welfare.

NUTRITION AND FOOD SECURITY

WATER, SANITATION, AND HYGIENE

WATER, SANITATION, AND HYGIENE (WASH) – refers to the **provision of safe water for drinking, washing, and domestic activities**, the **safe removal and final disposal of waste**, and **health promotion activities** to encourage protective healthy behaviors in the population or community (WHO, 2017). Whether in regular or emergency situations, WASH is essential to protect health and prevent disease outbreaks.

In collaboration with the local government and communities, nurses **participate in designing, building, and maintaining water and sanitation systems to withstand the risks of disasters** (ibid). This will also ensure health facilities and health care providers have adequate water supply to support delivery of life-saving and quality health care, infection prevention, and hygiene promotion in disasters and emergencies (ibid).

CONTROL AND SURVEILLANCE OF ENDEMIC DISEASES

Endemic diseases refers to diseases that are constantly present or usually prevalent in a population within a geographic area or community (US CDC, 2012). Endemic diseases in the Philippines include communicable diseases such as influenza, dengue, malaria, among others – and non-communicable diseases such as hypertension and diabetes.

When there is a sudden increase in the number of cases of a disease above what is normally expected in the population in a specific area, an **outbreak** occurs. An **epidemic** covers a wider area and population, while a **pandemic** refers to an epidemic that has spread over multiple countries or continents, affecting a large number of people.

In disaster prevention and mitigation, nurses must be able to **conduct public health surveillance** through using data to monitor health problems to facilitate their prevention or control (US CDC, 2012).

DISASTER PREPAREDNESS

DISASTER PREPAREDNESS

DISASTER PREPAREDNESS – "the **knowledge and capacities** developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions". (RA 10121)
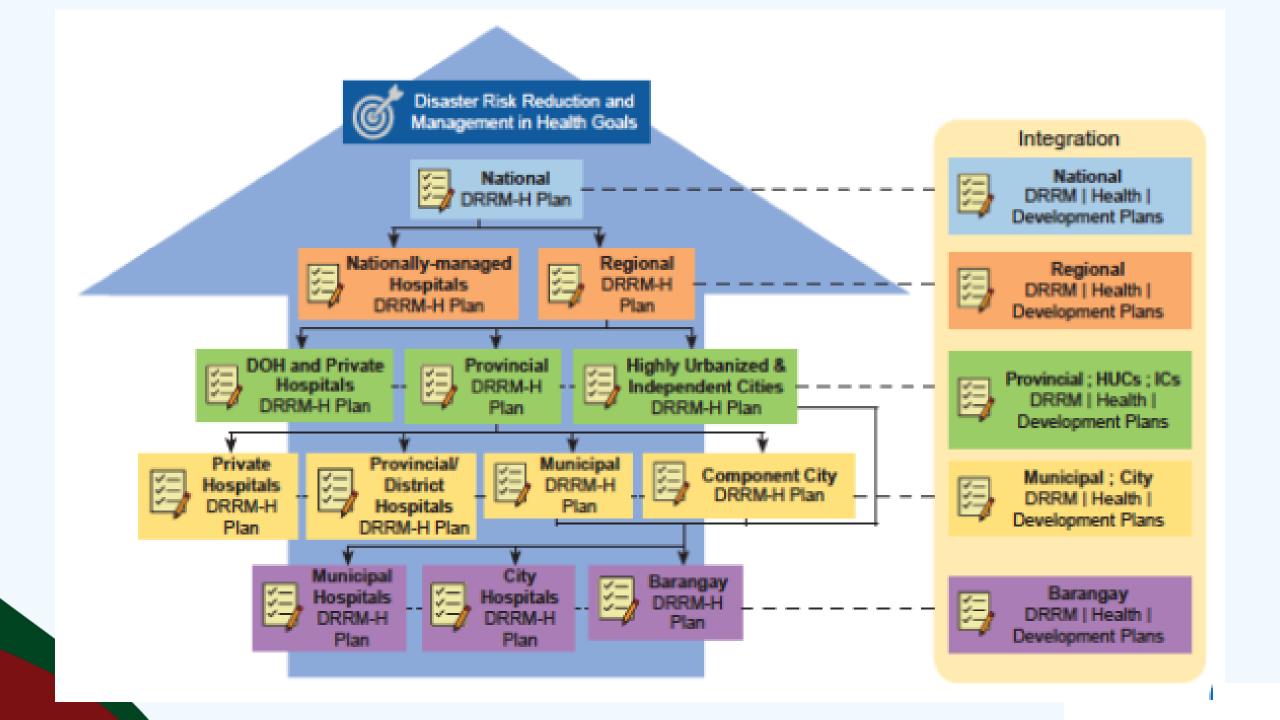
In the context of health and nursing, preparedness generally focus on **establishing and strengthening capacities of communities** to anticipate, cope, and recover from the negative impacts of emergency occurrences and disasters (WHO & ICN, 2009).

PLANNING FOR DISASTERS AND EMERGENCIES

- **Needs Assessment**
- **Background work (situational analysis) on:**
  - **Policies and plans**
  - **Environment and epidemiology/population**
- **Stakeholder Involvement**
- **Prioritization and Goal Setting**
- **Identification of Strategies and Activities**
- **Identification of Appropriate Indicators**
- **Review of the Plan**
- **Implementation of the Plan**
- **Evaluation of the Results/Impact**

DISASTER RISK REDUCTION AND MANAGEMENT IN HEALTH (DRRM-H) PLANNING

The government, as the primary duty bearer, is responsible for ensuring the safety and welfare of its citizens. In the context of disasters and emergencies, the national and local governments are responsible for preparing and implementing plans to ensure resilient health systems at the national, regional, provincial, city, municipal, and barangay levels as well as hospitals (DOH, 2020).

DISASTER PREPAREDNESS PLANNING

Disaster preparedness usually entails a number of plans. Among the most essential at the local level are the (1) main local DRRM plan (where the local DRRM-H plan should be integrated), (2) contingency plan (one for each local hazard), (3) public service continuity plan, and (4) evacuation plan.

Other disaster preparedness plans nurses must be familiar with are: (1) surge capacity plan, (2) mass casualty management plan, as well as (3) safety and security plan.
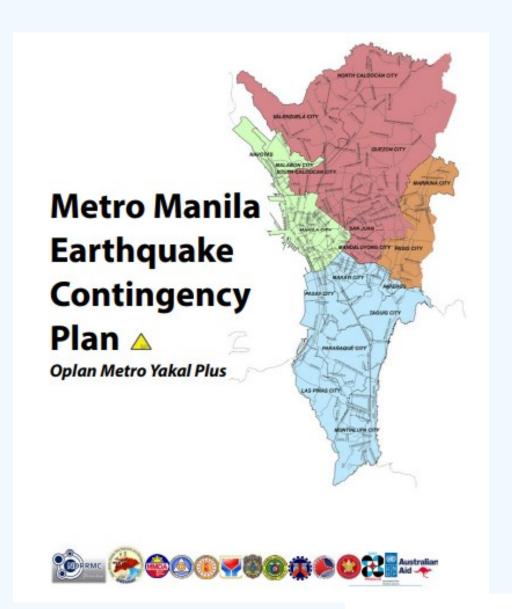
CONTINGENCY PLANNING

A **contingency plan** includes **analysis of specific potential events or emerging situations** that might threaten the health of the population already affected or potentially affected (DOH, 2020). This involves advance arrangements to enable timely, effective and appropriate responses to such potential events and situations, resulting to a scenario-based plan (ibid).

Contingency plans define the **roles and responsibilities of involved institutions and stakeholders** (who does what and how), **coordination mechanisms and other operational arrangements across sectors** that are set off before, during and after emergencies (CCS, MaCEC & SAC Northern Quezon, 2011). These are **developed for different worst-case scenarios per hazard**, and practiced through regular drills and simulations to build awareness, identify flaws and gaps in the plan, and revise the plan to ensure the safety of the population (ibid). Contingency planning is critical to ensuring the overall preparedness of communities to disasters (ibid).

CONTINGENCY PLANNING

"The Metro Manila Earthquake Contingency Plan or Oplan Metro Yakal Plus is Metro Manila Disaster Risk Reduction Management Council's (MMDRRMC) response tool based on the 7.2 Magnitude movement of the West Valley Fault (WVF) with Intensity VIII ground shaking. It aims to institutionalize an effective and efficient system of earthquake disaster preparedness and response of the MMDRRMC members and partners by defining their roles and responsibilities guided by sets of actions that shall be carried out prior to and immediately after a strong earthquake."

Metro Manila Earthquake Contingency Plan △

Oplan Metro Yakal Plus

PUBLIC SERVICE CONTINUITY PLAN

A **public service continuity plan** (also known as business continuity plan in the private sector) **recognizes threats and risks** facing an institution, including protection and functionality of personnel and assets in the event of a disaster (DOH, 2020).

It includes defining potential risks, determining how those risks will affect operations, implementing safeguards and procedures designed to mitigate those risks, testing those procedures to ensure that they work, and periodically reviewing the process to make sure that it is up to date (ibid).

EVACUATION PLAN

Evacuations are timely and rapid movement of people exposed to imminent or actual danger to safer locations and places of shelter (Global CCCM, 2014). In case of hazard events such as typhoons, floods, earthquakes, and tsunami, hundreds to millions of people are needed to be moved within a very short period of time. In these situations, evacuation planning is crucial to effectively mobilize and coordinate capacity and resources, manage the safe and timely evacuation of all persons at risk, meet emergency needs and assistance, and ensure evacuees and other affected people are able to recover from the disruption and risks created by their displace as soon as possible (ibid).

EVACUATION PLAN

QUADRANT	EVACUATION CAMPS (MMDRRMC MANAGED)	EMERGENCY FIELD HOSPITALS
NORTH	• Veterans Memorial Medical Center, North Ave., Quezon City • University of the Philippines (UP) Diliman Grounds	• Veterans Memorial Medical Center, North Ave., Quezon City • Quezon Memorial Circle
EAST	• Marikina Boys Town • Red Cross Compound, Marikina City • Ultra, Pasig	LRT 2 Santolan Station Depot, Santolan, Pasig City
WEST	Intramuros Golf Course	Intramuros Golf Course
SOUTH	Villamor Air Base Golf Course, Pasay	Villamor Air Base Golf Course, Pasay

6.2. Each Evacuation Camp should have the following manpower per team per shift. Two shifts per day at 12 hours per shift:

PERSONNEL	RATIO/ NUMBER
Medical Doctor	1: 750 Evacuees
Nurse	2: 1 Medical Doctor or 1:1500 Evacuees
Rural Health Midwife (RHM)	1:1 Medical Doctor
WASH	1 Sanitary Engineer and 3 RSIs/spray man
MHPSS	1 Nurse, possibly from National Center for Mental Health
Nutritionist	1
Driver	1
Utility	2
Regional Epidemiology Surveillance Unit (RESU)	1

SURGE CAPACITY PLAN

Surge capacity is the increased capacity to meet increased demand for health services beyond normal working or operational capacity (DOH, 2020). There are three (3) essential components of surge capacity: (1) staff, (2) stuff (i.e. equipment, medicines, and supplies, and (3) structure (i.e. physical and organizational such as Incident Command System or Incident Management System) (Kaji, Koenig & Bey, 2006).

In medical and public health events where patient care needs exceed existing resources, patient care capacity should be increased (ibid). This Is done by increasing the three components of surge capacity.

MASS CASUALTY MANAGEMENT PLAN

A **mass casualty incident** is an event that generates more patients at one time than locally available resources can manage using routine procedures, and requires exceptional emergency arrangements and additional or extraordinary assistance (WHO, 2007).

Effective management of mass casualties requires coordinated efforts across various sectors. The effects of mass casualty incidents are particularly experienced at the community level, and should be the focus of disaster preparedness efforts (ibid).
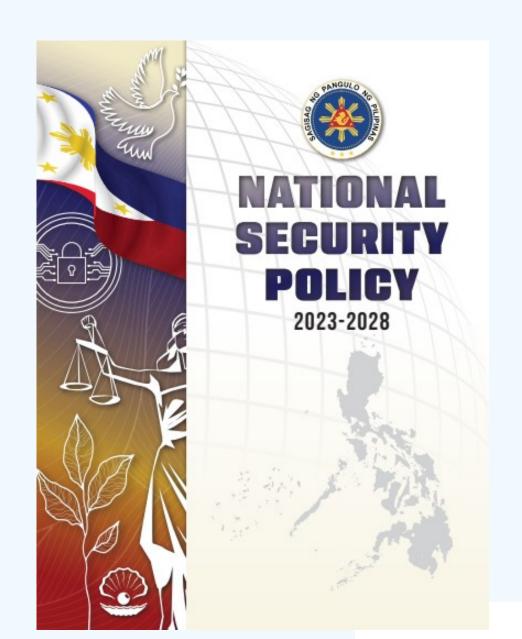
SAFETY AND SECURITY PLAN

Safety and security must be maintained particularly within and around evacuation centers, where displaced persons with varying ages, gender, and socioeconomic status stay temporarily.

To prevent risks and respond to incidents, safety and security responsibilities include (Global CCCM, 2014):
- Security assessments of evacuation and transportation sites
- Maintaining general site security at designated evacuation locations
- Screening evacuees for prohibited weapons
- Preventing and/or responding to common crime and/or inadequate law enforcement
- Preventing and/or responding to incidents of GBV
- Preventing and/or responding to abuse, neglect and exploitation of children
- Overcoming discriminatory access to basic provisions and services

SAFETY AND SECURITY PLAN

*"The national security goals identified in the new [National Security Policy 2023-2028](#) were based on an assessment of the emerging strategic landscape and placed within the context of the country's socio-political values, fundamental laws, and core national interests. The new NSP features several national security agenda under each of these core national security interests: National Sovereignty and Territorial Integrity; Political Stability, Peace, and Public Safety; Economic Strength and Solidarity; National Identity, Harmony, and Culture of Excellence; **Ecological Balance and Climate Change Resiliency**; Cyber, Information, and Cognitive Security; and Regional and International Peace and Stability"*

OTHER ASPECTS OF DISASTER PREPAREDNESS

GO BAG

GO BAG
EMERGENCY PREPAREDNESS BAG

THE "GO BAG" CONTAINS ITEMS NEEDED BY THE FAMILY TO SURVIVE

REMINDERS:

1 The GO BAG should be checked and replenished every 3 months.

2 The GO BAG should be stored properly where it can be easily accessed in case of an emergency.

3 Coordinate with leaders on community evacuation plan, Decide with the family where to meet in case there is a need to evacuate.

IMPORTANT DOCUMENTS IN WATERPROOF CONTAINER

SPARE CASH INCLUDING COINS

MOBILE PHONES, POWERBANKS & CHARGERS

FIRST AID KIT WITH REMEDIES FOR FEVER, LBM, MINOR WOUNDS, PAIN AND MAINTENANCE MEDICINES

CLOTHING, RAIN COAT, BOOTS & SANITARY SUPPLIES

FLASHLIGHT, WHISTLE, CANDLES & MATCHES

ITEMS FOR SPECIAL NEEDS OF YOUNGER AND OLDER MEMBERS OF THE FAMILY INCLUDING PWDS

SLEEPING BAGS, MATS & BLANKETS

RADIO WITH FRESH & EXTRA BATTERIES

DRINKING WATER IN SEALED CONTAINER ENOUGH FOR 3 DAYS

EASY TO SERVE, READY TO EAT FOOD ENOUGH FOR 3 DAYS

ROPES, OLD NEWSPAPER & ECO BAGS MADE FROM STRONG MATERIALS

NEWS

Source: OCD

NDRRMC
NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL

GO BAG

ANY QUESTIONS? CLARIFICATIONS?